NOTE.—*The application for Patent has become void.*
This print shows the Specification as it became open to public inspection.

PATENT SPECIFICATION

277,689

Convention Date (Austria): Sept. 17, 1926.

Application Date (in United Kingdom): Sept. 17, 1927. No. 24,527/27.

Complete not Accepted.

COMPLETE SPECIFICATION.

Improvements in Telephonic Loudspeakers.

I, FRIEDRICH HORNY, of 9, Reichsratstrasse, Vienna I, Austria, an Austrian citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a telephonic, hornless loudspeaker of the kind wherein the sound is propagated by means of a large conical diaphragm to the apex of which a vibratory element is attached.

In these devices the purity of the sound reproduction depends to a large extent on the manner in which the diaphragm is supported. In the case of a diaphragm with light, unsupported rim, the vibrations cause the diaphragm to be bodily reciprocated, and the nature of the material out of which the diaphragm is made, has but little influence on the sound reproduction. If the rim is reinforced and heavy, its vibrations will be out of synchronism with those of the body of the diaphragm and give rise to distortion. If, on the other hand, the rim is firmly secured to a support, the resistance will be too great, and the diaphragm will be unable to respond to the very fine vibrations whereon depends the reproduction of the overtones, which are so essential to the tone colour of a musical instrument. Also in this case, the vibratory qualities of the material whereof the diaphragm is made, are more or less suppressed, which is amply shown in the case of gramophones, wherein an exchange of diaphragm material has no noticeable influence on the character of the sound.

The object of the present invention is to produce an arrangement whereby a material of good sound producing qualities will be able to exhibit these qualities to the utmost extent, and the invention consists in supporting the diaphragm rim on both or only on one side by material which holds the diaphragm so that it is neither perfectly free nor rigid. By this arrangement the vibrations of the outer portions of the diaphragm will be sufficiently restricted to prevent sound distortion, while the diaphragm is otherwise free to exhibit all the individual sound reproducing qualities of the material out of which it is made. Thus the overtones will be perfectly rendered, and an exceedingly clear, natural and soft sound reproduction will be obtained.

A suitable material for the diaphragm is composed of paper impregnated with artificial resin, and the supporting material is preferably composed of wadding.

To obtain the best effect, moreover, it is preferable to provide the loudspeaker with a plurality of diaphragms which are connected to the same operating element and which are either nested or arranged at opposite sides of said element.

Fig. 1 of the accompanying drawings represents a diagrammatic view of the arrangement with nested diaphragms,

Fig. 2, a view showing two diaphragms arranged at opposite sides of the operating element, and

Fig. 3, a sectional view of the diaphragm showing the supporting method.

The loudspeaker is provided with the usual operating element in the form of an electro-magnet 1 fitted with a vibratory armature 9. The latter is connected to the apex 8 of one or more slightly conical diaphragms which, by participating in the vibrations of the armature 9, reproduce and propagate the sound waves which give rise to the impulses passing through the magnet. The diaphragm or diaphragms are preferably made of one of the materials known under the trade mark of "Bakelit", "Cummoid" or "Pertinax". These materials are made of artificial resin which is rendered plastic by being heated to a temperature of about 200° C. and then forced under high pressure into a paper support.

The diaphragms are supported at the rim by one or more rings 7 of wadding or other suitable material having the property of damping the vibrations without holding the diaphragm in a perfectly rigid

[*Price* 1/-]

Price 1s 6d

manner. Preferably two wadding rings are employed between which the rim of the diaphragm is clamped, and the rim is formed with peripheral reinforcement corrugations 6 in which the wadding can engage for retaining itself in position and preventing displacement.

By supporting the diaphragm in this manner, the material, which has a thickness of about 0.1 to 0.2 mm. and is very light, glossy and elastic, will be able to exhibit its sound reproducing qualities in the most favourable manner.

Each diaphragm has the property, depending mostly on its size, of responding with the greatest efficiency to a given range of frequencies. In order to widen this efficiency range in a loudspeaker, therefore, a plurality of diaphragms of different sizes may be employed. Fig. 1 shows such an arrangement wherein two diaphragms 2 and 3 are employed, the smaller diaphragm being nested within the larger one so as to save space. Fig. 2 shows two diaphragms 4 and 5 arranged at opposite sides of the magnet 1 so as to be acted upon by the latter in opposite directions. This ensures greater uniformity of sound reproduction as it compensates for unequal stresses in the material. Additional diaphragms may be nested within the diaphragms 4 and 5 in order to widen the range of the maximum response still further.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A loudspeaker of the kind referred to wherein the diaphragm rim is supported at one or both sides by anti-vibration material.

2. A loudspeaker according to claim 1 wherein the rim of the diaphragm is formed with peripheral reinforcement corrugations in which the supporting material can engage for maintaining itself in position, substantially as set forth.

3. A loudspeaker according to claim 1 or 2 wherein two diaphragms are employed one of which is nested within the other, substantially as set forth.

4. A loudspeaker according to claim 1 or 2 wherein two diaphragms are employed and arranged at opposite sides of a common operating element, substantially as set forth.

5. A loudspeaker according to any of the preceding claims wherein the diaphragm is composed of paper impregnated with artificial resin.

Dated this 16th day of September, 1927

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Fig.1

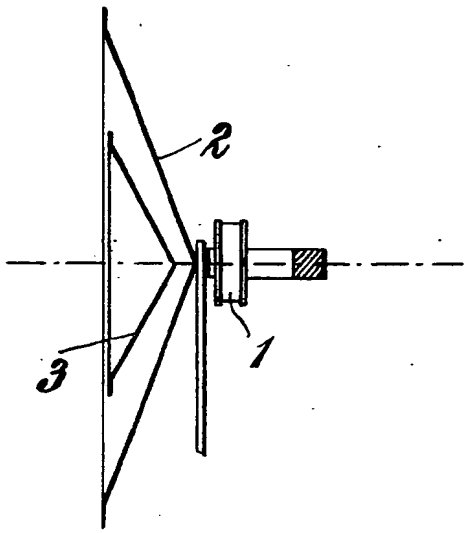


Fig.2

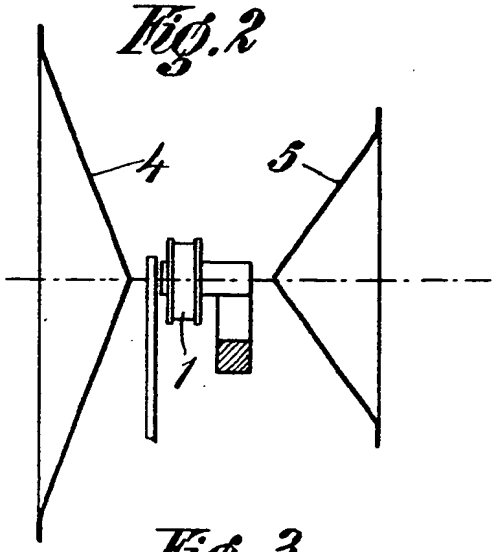
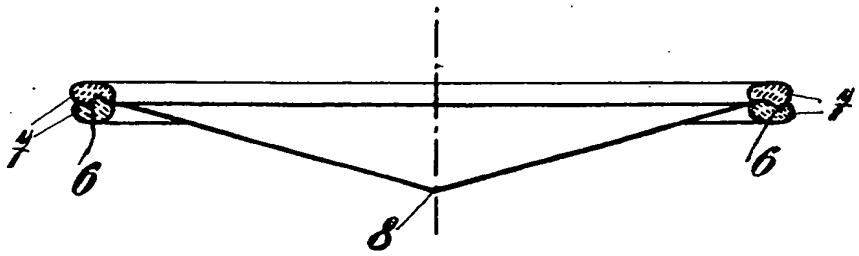


Fig.3



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